Chapter 2 – REMEDIAL ACTION OBJECTIVES

2.1 Introduction

The remedial action objectives (RAOs) of future cleanup actions at the Site are to provide remedial alternatives that protect human health and the environment (WAC 173-340-350). The proposed RAOs for the Site are designed to:

- Achieve CLs or RLs that will be protective of human health and the environment; and
- Comply with chemical-, location-, and action-specific applicable, relevant, and appropriate requirements (ARARs).

MTCA (Chapter 173-340 WAC) requires that cleanup actions meet Cleanup Standards at least as stringent as those under the Superfund Amendments and Reauthorization Act of 1986 (SARA), and WAC 173-340-710 requires that all cleanup actions be in compliance with applicable state and federal laws. Section 121 (d) of the SARA requires cleanup actions at Superfund sites to attain the "applicable or relevant and appropriate" requirements of federal and state environmental laws and regulations.

Because of the complexity of the Site, a Site-specific RA using land use specific exposure scenarios was used to develop CLs and RLs protective of human health and the environment (WAC 173-340-700 (3)(c)).

Section 2.2 discusses applicable or relevant and appropriate requirements (ARARs) for the cleanup action(s) at the Site, as specified under MTCA and federal regulations. Section 2.3 presents chemical-specific requirements based on ARARs and risk-based CLs or RLs. Sections 2.4 and 2.5 discuss the location and action-specific ARARs for the Site cleanup action(s). Section 2.6 summarizes the various RAOs identified from a consideration of ARARs and Site-specific risks. These RAOs form the basis for remediation alternatives presented in subsequent sections of this FS report.

2.2 Potentially Applicable State and Federal Requirements for the FS

2.2.1 Introduction

The specific standards that help to determine when RAOs have been met for Site cleanup under a MTCA consent decree are applicable state and federal laws. The selected remedies in the FS must be protective of human health and the environment and comply with these laws.

MTCA (Chapter 90.105D RCW) governs investigation and cleanup of the Site. Cleanup standards in the MTCA regulations (WAC 173-340) consist of the following:

- Cleanup or remediation levels for hazardous substances present at a site (constituent concentrations in affected media).
- Points of compliance (locations where cleanup levels must be met).
- Other regulatory requirements of applicable state and federal laws (requirements that apply to a site because of the type of action and/or the location of the site).

This section of the FS addresses the following: applicable state and federal laws for the cleanup action(s) at the Site, as specified under MTCA; chemical-specific CLs or RLs based on the MTCA regulations and the ARARs; and state and federal laws that apply to cleanup locations and cleanup actions.

2.2.2 Applicable State and Federal Laws

Under MTCA, "applicable state and federal laws" are all legally applicable requirements and those requirements that Ecology determines are relevant and appropriate. Therefore the definition is similar to the federal Superfund concept of "applicable or relevant and appropriate requirements" or ARARs. The term ARARs is used throughout the MTCA regulations and is also used here.

In WAC 173-340-710, MTCA defines legally applicable requirements as those cleanup standards, standards of control, and other environmental protection requirements, criteria, or limitations adopted under state or federal law that specifically address a hazardous substance, cleanup action, location, or other circumstances at a site.

MTCA defines "relevant and appropriate requirements" using the same words as those in Superfund guidance: *"those cleanup standards, standards of control, and other human health and environmental requirements, criteria, or limitations established under state or federal law that, while not applicable to the hazardous substance, cleanup action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to a particular site"* (italics added). The criteria used to make this determination are presented in WAC 173-340-710(4)(a)-(i).

Remedial actions conducted under a consent decree with Ecology must comply with the substantive requirements of the ARARs but are exempt from their procedural requirements (e.g., obtaining permits and approvals) (WAC 173-340-710(9)). Specifically, this exemption applies to requirements under the Washington State Water Pollution Control Act, Solid Waste Management Act, Hazardous Waste Management Act, Clean Air Act, State Fisheries Code, and Shoreline Management Act. It also applies to local laws requiring permits or approvals.

This section includes a discussion of the three types of ARARs: chemical-, location-, and action-specific. The definitions of these ARAR types and the potential ARARs for the Site that fall into these categories are presented in the following subsections.

2.3 Potential Cleanup Levels and Chemical-Specific ARARs

The remediation of contaminated Site media must meet the cleanup standards developed under MTCA and also meet chemical-specific ARARs. Chemical-specific ARARs include those requirements that regulate the acceptable amount or concentration of a constituent that may be found in or released to the environment.

MTCA requires that CLs or, if allowed, RLs be derived for contaminated media at hazardous waste sites. Ecology allows the use of site-specific data to determine risk-based CLs and RLs. If a calculated CL is less than the natural background concentration or the detection limit, the cleanup level would be set at background or the detection limit, whichever is higher (WAC 173-340-700(4)(d)). The RA used this approach to determine the appropriate CLs or RLs. Institutional controls, as defined by MTCA, can be used in conjunction with remedial actions in developing the cleanup alternatives. Table 2-1 summarizes the CLs and RLs approved for the Site by Ecology. This list was used in the RA to evaluate Site contamination. This list is not inclusive and will require re-evaluation based upon the preferred alternative.

MTCA also requires ecological evaluations at sites that may pose a threat to the terrestrial environment (WAC 173-340-7490 and 173-340-7491). These evaluations may be either simplified (WAC 173-340-7492) or site-specific (WAC 173-340-7493). The RA used Site-specific data to determine ecological soil screening level that is protective of ecological receptors. This screening level was used to screen the evaluation units (EUs).

2.4 Potential Location-Specific Requirements

Location-specific ARARs are those requirements that restrict the concentration of hazardous substances or the performance of activities solely because they occur in specific locations. For each of the following location-specific ARARs, a determination of whether they are applicable or are relevant and appropriate will be made after a detailed development of each FS alternative. A discussion of the location-specific ARARs that potentially apply to the Site follows.

Washington State Shoreline Management Act (Chapter 90.58 RCW; Chapters 173-18, 173-22, and 173-27 WAC): The substantive requirements of this statute and its implementing regulations apply to activities within 200 feet of shorelines in the state, which includes the shoreline of Sequalitchew Creek (WAC 173-18-310) and associated wetlands, but not the shoreline of Old Fort Lake (WAC 173-20-560) or Puget Sound which is over 200 feet from the Site. Proposed remedial actions must be consistent with the policies and goals of the approved Washington State coastal zone management program and with the policies and shorelands use designations of the local jurisdiction's shoreline master plan (Pierce County shoreline designation maps, WAC 173-22-0636).

Pierce County Shoreline Management Use Regulation (Title 20): Shorelines within Pierce County include all marine shorelines, shorelines and associated wetlands of streams with a mean annual flow of at least 20 cubic feet per second (cfs), and lakes and associated wetlands that are at least 20 surface acres (Old Fort Lake is approximately 13 acres). The flow rate of Sequalitchew Creek peaks in the spring and was measured in 1999 at approximately 25 cfs. Pierce County regulation provides constraints on "use activities" such as dredging and shoreline disposal of fill.

Pierce County Development Regulations—Critical Areas (Title 18E): This regulation protects critical areas by limiting any actions that are planned within 150 feet of a wetland or 35 feet of a stream, or near geologic hazard areas (steep slopes) or fish and wildlife habitat areas. Pierce County has mapped in an atlas, critical areas and wetlands in areas it has surveyed. This regulation establishes required buffer zones for actions adjacent to any of the above critical areas. Such actions could include any work along Sequalitchew Creek, and Old Fort Lake.

Washington State Hydraulic Projects Approval (Chapters 75.20.100 Through 75.20.160 RCW; Chapter 220-110 WAC): This statute and its implementing regulations apply to any work conducted in Puget Sound or within the designated shoreline that changes the natural flow or bed of the water body (and therefore has the potential to affect fish habitat). The requirements include bank protection (WAC 220-110-050), saltwater technical provisions, and prohibited work times in saltwater areas, such as juvenile salmon outmigration periods. Any work along Sequalitchew Creek will involve consultation with the Washington State Department of Fish and Wildlife (WDFW) to determine appropriate mitigation measures.

The Fish and Wildlife Coordination Act: The Fish and Wildlife Coordination Act requires actions that will result in the control or structural modification of any natural body of water for any purpose, to protect the fish and wildlife resources that may be affected by the action. The U.S. Fish and Wildlife Service (USFWS) and appropriate state agencies must be consulted to ascertain the means and measures necessary to mitigate, prevent, and compensate for project-related losses and to enhance resources. This regulation applies to any actions taken on Sequalitchew Creek. Fish species using Sequalitchew Creek include chum salmon (O*ncorhyncus keta)*, coho salmon (O*ncorhyncus kisutch*), and cutthroat trout (*Salmo clarki)*. Adult chum are reported to spawn in the lower 650 feet of the creek.

Endangered Species Act (16 USC 1531 et seq.; 50 CFR Parts 17, 225, and 402) : This act protects fish, wildlife, and plants species whose existence is threatened or endangered (T/E). The Coho salmon and the bald eagle are candidate T/E species in the Puget Sound ecologically significant unit. The requirements of this regulatory program apply to cleanup actions that may affect a listed T/E species or designated critical habitat. Applicability will be determined via discussions with the USFWS and the

National Marine Fisheries Service (NMFS), as appropriate. A biological assessment could be required by the agencies to evaluate whether the remedial action is likely to affect endangered species.

Native American Graves Protection and Repatriation Act (25 USC 3001 Through 3013; 43 CFR Part 10) and Washington's Indian Graves and Records Law (Chapter 27.44 RCW): These statutes prohibit the destruction or removal of Native American cultural items (human remains and associated funerary objects, graves, cairns, pictographs, glyptics, or other painted records) and require written notification of their inadvertent discovery to the appropriate agencies and Native American tribe. Because the Site area has been occupied or otherwise used by Native American tribes, remediation activities could uncover Native American graves or other protected items; therefore these programs are applicable to the Site cleanup, but only if the listed items are found. The remedial action must cease in the area of the discovery; a reasonable effort must be made to protect the items discovered before such activity is resumed; and notice must be provided as described above.

Archaeological Resources Protection Act (16 USC 470aa et seq.; 43 CFR Part 7): This program sets forth requirements that are triggered when archaeological resources are discovered. It requires that excavation of these resources be conducted under a permit by professional archaeologists. These requirements apply only if archaeological items are discovered during implementation of the selected remedy.

National Historic Preservation Act (NHPA) (16 USC 470 et seq.; 36 CFR Parts 60, 63, and 800): This regulatory program sets forth a national policy of historic preservation and provides a process that must be followed to ensure that impacts of actions on archaeological, historic, and other cultural resources are considered. NHPA requirements apply to federal sites but should be considered when evaluating location specific ARARs at the Site.

2.5 Potential Action-Specific Requirements

Action-specific ARARs are requirements that define acceptable management practices and are usually specific to certain kinds of activities that occur or technologies that are used during the implementation of cleanup actions.

Washington Dangerous Waste Regulations (Chapter 173-303 WAC): These requirements potentially apply to the identification, generation, accumulation, and transport of hazardous/dangerous (hazardous) wastes at the Site. Under Ecology's Area of Contamination (AOC) policy, if contaminated soil is managed within an AOC, it is not considered to be “generated” as a hazardous waste, even if constituent concentrations would cause it to exceed regulatory levels and ordinarily be called a hazardous waste. Ecology may set an AOC or AOCs for a site-undergoing cleanup under a MTCA Consent Decree. Hazardous waste requirements would therefore not apply unless the wastes resulting from the Site cleanup action were moved outside the boundary of the AOC.

Federal land disposal restrictions (LDRs) under 40 CFR Part 268 require that hazardous wastes be treated prior to being disposed of in a land-based disposal unit. EPA has developed special LDRs for contaminated soil and debris. The treatment standards for these substances are expressed as numerical limits and treatment methods, respectively. These standards would generally not apply to contaminated media disposed of within an AOC; however, they could be relevant and appropriate.

Solid Waste Management Act (Chapter 70.95 RCW; Chapter 173-304 and 173-351 WAC): Potential Site cleanup actions include on-Site treatment and consolidation of solid wastes. MTCA specifically includes the solid waste landfill closure requirements as a potential ARAR. If wastes or contaminated soil are to be disposed of on-site, the design requirements of the solid waste landfill regulations may be relevant and appropriate. These design standards include slope, cover, and other structural requirements.

Water Quality Standards for Surface Waters of the State of Washington (Chapters 90.48 and 90.54 RCW; Chapter 173-201A WAC): This regulation is an action-specific ARAR because the remedial actions at the Site (e.g., soil movement and disposal) must not result in any exceedance of surface water quality standards (unless a short-term modification of water quality has been approved by Ecology ahead of the activity; see WAC 173-201A-110). Surface water quality standards such as turbidity, temperature, and metal limits could apply to the remedial actions.

Ecology has designated Puget Sound as a Class A (excellent) water body; Sequalitchew Creek is also a Class A surface water body. Old Fort Lake would fall into the Lakes class. These classifications determine the beneficial uses that must be maintained for the surface water thus labeled and, therefore, the water quality standards as well (i.e., the higher the water quality, the more stringent the standard may be).

This regulation also governs the discharge of wastewater to surface water and groundwater, including discharges from municipal sewer systems to surface water or groundwater. Finally, it provides for use of best management practices for stormwater management on construction sites. Specifically, Chapter 173-216 WAC requires that all known, available, and reasonable treatment (AKART) be used to remove contaminants from wastewater prior to discharge to meet state surface water and groundwater quality standards.

Federal, State, and Local Air Quality Protection Programs: Regulations promulgated under the federal Clean Air Act (42 USC 7401) and the Washington State Clean Air Act (Chapter 70.94 RCW) governs the release of airborne contaminants from point and non-point sources. Local air pollution control authorities such as the Puget Sound Clean Air Agency (PSCAA) have also set forth regulations for implementing these air quality requirements.

Chapter 173-460 WAC, Controls for New Sources of Toxic Air Pollutants, requires that point-source emissions for major sources of regulated air toxics be treated using best available control technologies for toxics (T-BACT) prior to discharge, and that emissions do not cause ambient air concentrations of these chemical constituents to exceed established ambient source impact levels (ASILs). Chapter 173-460 WAC establishes ASILs for several of the chemical constituents at the Site, including arsenic, mercury, TNT, and PAHs. Similar requirements and ambient concentration limits have been adopted by PSCAA under Regulation III, and it is these local requirements, which are at least as stringent as the state and federal requirements, that apply to the Site.

Department of Transportation Hazardous Materials Regulations (40 CFR Parts 171 Through 180): The U.S. DOT has promulgated regulations that govern the transportation of hazardous materials, including packaging, labeling, placarding, and communications and emergency response requirements. The U.S. DOT and state regulations will apply to any hazardous materials transported off-site as part of the remediation.

Washington State Water Well Construction Act (Chapter 18.104 RCW; Chapter 173-160 WAC): This regulation governs the minimum standards for construction, maintenance, and abandonment of wells, including both water supply wells and resource protection wells (e.g., monitoring wells). These regulations will apply to any Site monitoring wells that are closed (abandoned) as part of the remedial action or new wells installed.

City of DuPont Regulations and Standards: The City of DuPont has established regulations and standards which governs the minimum standards for grading and setbacks from sensitive areas and wetlands. These substantive requirements of these regulations and standards, as they relate to the cleanup process, will be met and addressed as part of the remedial design process.

2.6 Screening of ARARs

A screening of ARARs was conducted to assess their applicability to the Site. Only those that were determined to be applicable were retained as an RAO. The following list identifies the ARARs that are potentially applicable to the Site.

Potential Cleanup Levels and Chemical-Specific ARARs

- The Model Toxics Control Act (Chapter 173-340 WAC).

Potential Location-Specific Requirements

- Washington State Shoreline Management Act (Chapter 90.58 RCW; Chapters 173-18, 173-22, and 173-27 WAC).
- Pierce County Shoreline Management Use Regulation (Title 20).
- Pierce County Development Regulations—Critical Areas (Title 18E).
- Washington State Hydraulic Projects Approval (Chapters 75.20.100 Through 75.20.160 RCW; Chapter 220-110 WAC).
- The Fish and Wildlife Coordination Act.
- Endangered Species Act (16 USC 1531 et seq.; 50 CFR Parts 17, 225, and 402).
- Native American Graves Protection and Repatriation Act (25 USC 3001 Through 3013; 43 CFR Part 10) and Washington's Indian Graves and Records Law (Chapter 27.44 RCW).
- Archaeological Resources Protection Act (16 USC 470aa et seq.; 43 CFR Part 7).

Potential Action-Specific Requirements

- Washington Dangerous Waste Regulations (Chapter 173-303 WAC).
- Solid Waste Management Act (Chapter 70.95 RCW; Chapter 173-304 and 173-351 WAC).
- Water Quality Standards for Surface Waters of the State of Washington (Chapters 90.48 and 90.54 RCW; Chapter 173-201A WAC).
- Federal, State, and Local Air Quality Protection Programs.
- Department of Transportation Hazardous Materials Regulations (40 CFR Parts 171 Through 180).
- Washington State Water Well Construction Act (Chapter 18.104 RCW; Chapter 173-160 WAC).
- City of DuPont Regulations and Standards.

Table 2-1 – Risk-Based Remediation Levels

Constituent	Site Specific Cleanup Levels[1] (mg/kg)	MTCA Method C Industrial Cleanup Level[2] (mg/kg)	Commercial Remediation Level (mg/kg)	Golf Course Land Use Remediation Level (mg/kg)	Historical Remediation Level (mg/kg)	Open Space Remediation Level (mg/kg)
Explosives						
Total DNT	3.0	–	–	–	–	–
2,4,6-Trinitrotoluene	1.75	1,750	1,230	1,230	172	172
Inorganics						
Arsenic	32	90	60	60	32[4]	32[4]
Lead[3]	–	1,000	2,100	2,100	1,500	1,500
Mercury	24	1,050	737	737	247	247
Pesticides						
Aldrin	–	7.7	5	5	0.3	0.3
TPHs and PAHs						
Bunker C	7,600	–	–	–	–	–
Benzo(a)Pyrene	–	18	13	13	0.7	0.7

Notes:
[1]Where remediation levels were calculated for both carcinogenic and noncarcinogenic effects, the value shown in the table is the lower of the two values.
[2]Industrial Cleanup levels were calculated using equations and exposure factors for MTCA Method C (WAC 173-340-745)
[3]Except for the Industrial lead soil level, which is the historical MTCA Method C industrial value, all other lead values were derived by Ecology using the lead biokinetic models for children and adults (Ecology, 1999a).
[4]Value is site-specific background level for arsenic. This level was approved for use by Ecology (Ecology, 1999b).
– = Not developed.

2.7 References for Chapter 2

URS Corporation (URS). 2000. *Cultural Resources Protection Plan, Remedial Investigation/Feasibility Study,* Appendix G. Former DuPont Works Site, Dupont, Washington.

Ecology (Washington State Department of Ecology). 1999a. Non-Residential Remediation Levels at the Former DuPont Works Site. Memo from Mike Blum to Vern Moore and Izzy Zanikos. May 3, 1999. (Memo is presented in Appendix C).

Ecology (Washington State Department of Ecology). 1999b. Soil Arsenic Non-Residential Remediation Levels. Memo from Mike Blum to Vern Moore and Izzy Zanikos. June 25, 1999. (Memo is presented in Appendix C).

EPA, 1992. Guidance on Risk Characterization for Risk Managers and Risk Assessors. Memorandum from F. Henry Habicht II, Deputy Administrator, to Assistant and Regional Administrators. February 26, 1992.

Pioneer Technologies Inc., 2002. Draft Risk Assessment, Former DuPont Works Site, Dupont, Washington. March 15, 2002.

Hart Crowser, 1992. Management Plan, Remedial Investigation/Feasibility Study, Former DuPont Works Site, Dupont, Washington. January 17, 1992.